

**DEPARTMENT OF TRANSPORTATION**

DIVISION OF ENGINEERING SERVICES

Office of Structural Materials

Quality Assurance and Source Inspection



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Contract #: 04-0120F4Cty: SF/ALA Rte: 80 PM: 13.2/13.9File #: 1.28**WELDING INSPECTION REPORT****Resident Engineer:** Casey, William**Address:** 333 Burma Road**City:** Oakland, CA 94607**Report No:** WIR-027125**Date Inspected:** 01-Feb-2012**Project Name:** SAS Superstructure**OSM Arrival Time:** 700**Prime Contractor:** American Bridge/Fluor Enterprises, a JV**OSM Departure Time:** 1730**Contractor:** American Bridge/Fluor Enterprises, a JV**Location:** Job Site**CWI Name:** Steve Jensen**CWI Present:** Yes No**Inspected CWI report:** Yes No N/A**Rod Oven in Use:** Yes No N/A**Electrode to specification:** Yes No N/A**Weld Procedures Followed:** Yes No N/A**Qualified Welders:** Yes No N/A**Verified Joint Fit-up:** Yes No N/A**Approved Drawings:** Yes No N/A**Approved WPS:** Yes No N/A**Delayed / Cancelled:** Yes No N/A**Bridge No:** 34-0006**Component:** OBG Components**Summary of Items Observed:**

On this date, Quality Assurance Inspector (QAI) Kenneth Riley was present at the San Francisco Oakland bay Bridge job site at Yerba Buena Island to observe erection and welding activities for the San Francisco Oakland Bay Bridge (SFOBB) project. This Quality Assurance Inspector (QAI) observed the following work performed by American Bridge/Fluor Enterprises (AB/F) personnel at the locations noted below:

A) Lifting Lug Holes

B) Field Splice 12W-13W

C) Field Splice 13W-14W

A). Lifting Lug Holes 13W (SPCM)

The QAI observed that welder Mike Jimenez, was placing the cover passes for location 13W-PP121.5-W4-W2 lifting lug hole. The welder was using the Shielded Metal Arc Welding (SMAW) using electrode E7018 for the Complete Joint Penetration weld with copper backing in the flat (1G) position under Welding Procedure Specification (WPS) ABF-WPS-D15-1050A-CU. The welder had pre-heat the area prior to welding using a weed burner at 40 degrees Celsius (150 degrees F) which was verified using a tempstik and infrared gun by the QC. The electrode used was 4.0mm diameter with welding amps verified as 188. The welder was using a chipping hammer, power grinder and power wire wheel for the interpass cleaning. The QC inspector for this location was Steve Jensen and was observed verifying and documenting the welding parameters for this location, along with overseeing the welding operations. At the time of the observations no issues were noted by the QAI.

Later in the shift the welder had completed the location above and moved to 13W-PP121.5-W4-W1. The QAI

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## WELDING INSPECTION REPORT

( Continued Page 2 of 5 )

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observed that welder Mike Jimenez, was fitting up this location and the QC inspector had checked the fit up tolerance for adherence to the Welding Procedure Specification (WPS) ABF-WPS-D15-1050A-CU which was found to be acceptable and verified by the QAI. The welder then proceeded to pre-heat the area prior to welding at 40 degrees Celsius (150 degrees F) which was verified using a tempstik and infrared gun by the QC. The welder was using the Shielded Metal Arc Welding (SMAW) using electrode E7018 for the Complete Joint Penetration weld with copper backing in the flat (1G) position. The electrode used was 4.0mm diameter with welding amps verified as 188. The welder was using a chipping hammer, power grinder and power wire wheel for the interpass cleaning. The QC inspector for this location was Steve Jensen and was observed verifying and documenting the welding parameters for this location, along with overseeing the welding operations. At the time of the observations no issues were noted by the QAI.

### B). Field Splice 12W-13W (SPCM)

The QAI observed welder Rich Garcia, had completed the weld up to the full height diaphragm at 12W-13W- A3 & A4 (A3-5000 to A4-1800) and was moving to the other side of the diaphragm to complete this section of weld (approximately 300mm up to A4-1800). The welder used the Carbon Arc Cutting (CAC) process to remove the back-up bar and back gouge the weld. The weld was then ground to bright metal and the QC inspector performed magnetic particle inspection to ensure sound weld metal prior to the beginning of the welding process. The results of the MT inspection were found to be acceptable as relayed to this QAI by QC inspector Fred Von Hoff. The welder then proceeded with the welding process under Welding Procedure Specification (WPS) ABF-WPS-D15-3110-4 for the Complete Joint Penetration weld using the Flux Cored Arc Welding (FCAW) process with the E71T-1M, 1.6mm electrode. The welding parameters were verified as 267 amps, 23.3 volts. The area for welding had been pre-heated to 40 degrees Celsius (150 degrees F) which was verified using a tempstik and infrared gun by the QC. The welder placed the root pass and then continued with the intermediate weld passes. The welder was observed using a power grinder and power wire wheel for the interpass cleaning by this QAI. The QC inspector for this location was Steve Jensen and was observed verifying and documenting the welding parameters for this location, along with overseeing the welding operations. At the time of the observations no issues were noted by the QAI.

Later in the shift the QAI observed that welder Rich Garcia, completed the 300mm of welding remaining for this location and moved back to the A5 location to start on the 4 repairs where QC had noted 4 rejectable indications with Ultrasonic Testing (UT) the location are;

#1

Y-1300mm

Length-40mm

Depth-13mm

#2

Y-1800mm

Length-40mm

Depth-7mm

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## WELDING INSPECTION REPORT

( Continued Page 3 of 5 )

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#3

Y-2580mm

Length-30mm

Depth-12mm

#4

Y-2880mm

Length-50mm

Depth-12mm

The welder preparing the locations for excavations by pre-heating the areas to 110 degrees Celsius (225 degrees F) prior to Carbon Arc Cutting as outlined within the Welding Procedure Specification (WPS)

ABF-WPS-D15-1004-Repair, the WPS also outlines that a minimum preheat temperature for welding shall be 110 degrees Celsius (325 degrees F). once the repair has been completed it is required the Post Weld Heat Treatment (PWHT) be applied at 230 degrees Celsius (450 degrees F) minimum and 315 degrees Celsius (600 degrees F) maximum for a period set of 1 hour for each 25mm of weld metal deposited but not less than 1 hour. The QC inspector for this location was Steve Jensen and was observed verifying and documenting the welding parameters for this location, along with overseeing the welding operations. At the time of the observations no issues were noted by the QAI.

### C). Field Splice 13W-14W-F1

The QAI observed welder Jeremy Dolman at the 13W-14W-F1 (edge plate) in the vertical (3G) position. The welder used the Carbon Arc Cutting (CAC) process to remove the back-up bar and back gouge the weld. The weld was then ground to bright metal and the QC inspector performed magnetic particle inspection to ensure sound weld metal prior to the beginning of the welding process. The results of the MT inspection were found to be acceptable as relayed to this QAI by QC inspector Steve Jensen. The Welding Procedure Specification (WPS) ABF-WPS-D15-3040B-3 for the Complete Joint Penetration weld using the Flux Cored Arc Welding (FCAW) process with the E71T-1M, 1.6mm electrode. The welding parameters were verified as 245 amps, 22.5 volts and Heat index of 2.21 k/j. The area for welding was then pre-heated prior to welding at 40 degrees Celsius (150 degrees F) which was verified using a tempstik and infrared gun by the QC. The welder was placing the root/intermediate and cover weld passes at the top 40% of the weld joint. The QC inspector for this location Steve Jensen was observed verifying and documenting the welding parameters for this location, along with overseeing the welding operations. At the time of the observations no issues were noted by the QAI.

Later in the shift the QAI observed that welder Jeremy Dolman was progressing upward within the weld joint, under Welding Procedure Specification (WPS) ABF-WPS-D15-3040B-3 for the Complete Joint Penetration weld using the Flux Cored Arc Welding (FCAW) process with the E71T-1M, 1.6mm electrode. The welding parameters were verified as 267 amps, 23.3 volts and Heat index of 2.32 k/j. The area for welding had been pre-heated to 40 degrees Celsius (150 degrees F) which was verified using a tempstik and infrared gun by the QC. The welder placed the root pass and then continued with the intermediate weld passes. The welder was observed using a power grinder and power wire wheel for the interpass cleaning by this QAI. The QC inspector for this location was Steve Jensen and was observed verifying and documenting the welding parameters for this location, along with overseeing the welding operations. At the time of the observations no issues were noted by the QAI.

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## WELDING INSPECTION REPORT

( Continued Page 4 of 5 )

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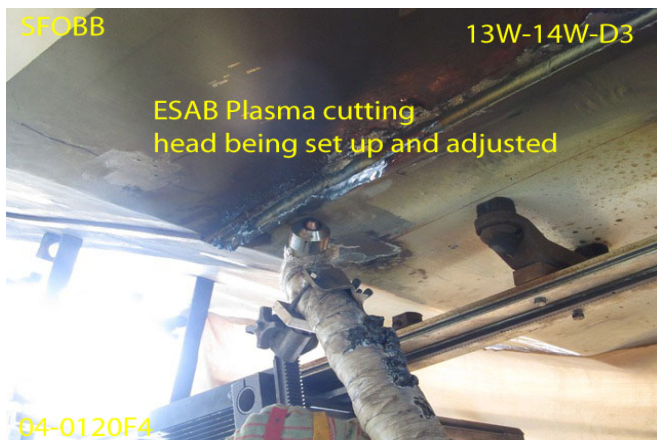
### 13W-14W-D2/D3 (Bottom Plate)

The QAI observed welder Rory Hogan at the 13W-14W-D3/D2 (bottom plate) in the overhead (4G) position. The welder used the semi-automated Plasma Cutting process to remove the back-up bar. This QAI noted that the Plasma equipment was set up with the Bug O system. The welder was making multiple passes while removing the backing bar. The welder was working this location with this process until the end of the shift.

### QA Observation and Verification Summary

The QA inspector observed the QC activities and the welding utilizing the WPS's as noted above, which appeared to be posted at the weld station. The welding parameters and surface temperatures were verified by the QC inspectors utilizing a Fluke 337 clamp meter for the electrical welding parameters and a Fluke 63 IR Thermometer for verifying the preheat and interpass temperatures. The consumables utilized for the welding process stated appeared to comply with the AWS Specification and AWS Classification. The QC inspection, testing and welding performed on this shift appeared to be in general compliance with the contract documents. At random intervals, the QAI verified the QC inspection, testing, welding parameters and the surface temperatures utilizing various inspection equipment and gages which included a Fluke 337 Clamp Meter and Tempilstik Temperature indicators.

Unless noted otherwise, all work observed on this date appeared to be in general compliance with the contract documents at the time of observations.



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## WELDING INSPECTION REPORT

( Continued Page 5 of 5 )

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### Summary of Conversations:

Basic conservation, fundamental to completion of the tasks at hand, occurred between this QAI and ABF QC personnel.

### Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Nina Choy (510) 385-5910, who represents the Office of Structural Materials for your project.

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<b>Inspected By:</b>	Riley, Ken	Quality Assurance Inspector
<b>Reviewed By:</b>	Levell, Bill	QA Reviewer

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